

June 1, 1994

US EPA RECORDS CENTER REGION 5

Ms. Leah Evison, RPM U.S. Environmental Protection Agency 77 West Jackson Blvd. HSRW-6J Chicago, IL 60604

RE: Comments on the Presumptive Remedy Risk Assessment for the Albion-Sheridan Township Landfill, Albion, Michigan

## Dear Leah:

The following presents WWES' responses to the Michigan Department of Natural Resources (MDNR) comments on the Presumptive Remedy Risk Assessment for the Albion-Sheridan Township Landfill in Calhoun County. The comments were presented in the April 29, 1994 memorandum from Linda D. Larsen, Environmental Response Division Toxicologist to Gene Hall, Environmental Response Division. Provided below is a summary of the MDNR comments and WWES' responses to those comments.

Comment - Section 2.3.3: U.S. EPA risk assessment guidance recommends that both filtered and unfiltered ground water samples be collected when water is of potable quality.

**Response:** Ground water samples were collected from both on-site monitoring wells and private wells according to the methods presented in the U.S. EPA and MDNR approved workplan.

Comment - Section 3.3.5: Elimination of essential nutrients from the list of chemicals of concern is appropriate only if they are shown to be present at levels which are not associated with adverse health effects. Since manganese exceeds the Type B health based drinking water criteria it should be carried through the risk assessment.

Elimination of compounds from the list of chemicals of concern based on frequency of detection is not encouraged if conducting a risk assessment on a large number of chemicals is feasible (e.g., because of adequate computer capability). In addition, elimination of compounds which are infrequently detected but which exceed MDNR Type B criteria, or any other applicable, relevant and appropriate requirement (ARAR), is not acceptable.

Response: Manganese was detected in both surface soil and on-site ground water samples at concentrations exceeding its background levels. Additionally, manganese was detected in the ground water samples at concentrations exceeding its Act 307 Type B criteria. However, manganese was not present in surface soils at concentrations exceeding its Type B soil criteria for the direct human contact pathway. An evaluation of the potential risks associated with exposure to manganese in ground water and surface soils are included in the risk assessment.

Additionally, two compounds (antimony and 1,2-dibromo-3-chloropropane) were detected in ground water at concentrations exceeding their respective Act 307 Type A and Type B criteria. Antimony was detected in one unconsolidated sediment and bedrock monitoring well. However, antimony was not detected in other environmental media at concentrations exceeding background. Likewise, 1,2-dibromo-3-chloropropane was detected in one unconsolidated sediment well at a concentration exceeding its Type B criteria. Like antimony, this compound was not detected in other environmental media at the site. Given the low frequency of occurrence of these compounds and the fact that these compounds were not detected in more than one environmental media, in accordance with RAGS a determination was made not to include these compounds in the risk assessment.

However, in order to provide the MDNR with an estimate of the potential risks associated with exposure to these compounds, the following quantitative risk values are presented. The calculated excess lifetime cancer risk from exposure (both the ingestion and dermal contact pathways) to 1,2-dibromo-3-chloropropane in the unconsolidated sediment ground water is  $1.3 \times 10^{-4}$  and  $1.2 \times 10^{-4}$ for the adult and child populations, respectively.

Exposure (both the ingestion and dermal contact pathways) to antimony in unconsolidated sediment ground water results in hazard quotients of 15 and 3.3 for the child and adult populations, respectively. Additionally, exposure (both the ingestion and dermal contact pathways) to antimony in bedrock ground water results in hazard quotients of 43 and 9.2 for the child and adult populations, respectively.

The recommended daily intake for manganese for children and adults are 0.6 to 1.0 mg/day and 2.0 to 5.0 mg/day, respectively (as reported in Recommended Dietary Allowances, National Research Council National Academy Press (1989). Assuming exposure to manganese at the highest concentration detected in ground water at the site (890 ug/L), the resultant daily intake for a child (assuming daily ingestion of 1 liter of water) is 0.89 mg/day. Likewise, assuming that an adult ingests 2 liters per day of water, the resultant daily intake of magnesium would be approximately 1.8 mg/day. Therefore,

the magnitude of exposure to manganese in ground water at the site would be less than the recommended daily allowance for that compound.

It should also be noted that manganese was only detected at concentrations exceeding its background level in monitoring wells located along the parameter of the landfill. Manganese was not detected above background concentrations in monitoring wells located further downgradient from the landfill. In addition, concentrations of manganese in the residential wells were below background.

**Comment - Section 5.1:** Use of relative potency factors to assess the potential risks associated with exposure to mixtures of carcinogenic PAHs.

**Response:** WWES has calculated the potential risks associated with exposure to mixtures of carcinogenic PAHs assuming carcinogenic potency equivalent to benzo(a)pyrene. The excess lifetime total cancer risk for exposure to surface soils (both the ingestion and dermal contact pathways) for the child population without application of the relative potency factors is 3.5 x 10<sup>-5</sup>. As presented in the risk assessment, the excess lifetime total cancer risk for exposure to surface soils (both the ingestion and dermal contact pathways) for the child population using the relative potency factors is 2.6 x 10<sup>-5</sup>. Therefore, at this particular site, the use of relative potency factors does not significantly alter the total risks for exposure to carcinogenic PAHs in surface soils.

Comment - Section 5.3: The statement is made that no toxicological information is available for chloroethane; however, a Type B drinking water criteria is listed in Table 1. The existence of a Type B criteria indicates that MDNR toxicologists have evaluated the available toxicological information and found sufficient basis for the development of health based criteria. An oral reference dose of 18 mg/kg/day and an oral slope factor of 3.8E-3 (mg/kg/day)-1 have been identified for chloroethane. Chloroethane should be carried through the risk assessment using the MDNR toxicity values

**Response:** Chloroethane was detected in one ground water sample at a concentration (0.9 ug/L) less than its Type A (1.0 ug/L) and Type B (9.1 ug/L) ground water criteria. WWES also reviewed the most recent IRIS and HEAST documents, as well as earlier HEAST documents dating back to 1989. The only toxicity information available for chloroethane was an inhalation reference concentration. For these reasons, chloroethane was not included in the risk assessment.

Application of the toxicity data provided by the MDNR results in excess lifetime cancer risks of  $3.8 \times 10^{-8}$  (child population) and  $4.1 \times 10^{-8}$  (adult population) for exposure to chloroethane in unconsolidated sediment ground water. The excess lifetime cancer risks associated with exposure to chloroethane do not exceed the  $10^{-6}$  risk level.

Comment - Section 6.1.1: The Administrative Rules for Act 307 specify the acceptable level of risk of excess cancer as  $1 \times 10^{-6}$ . This differs from the U.S. EPA use of an acceptable risk range of  $1 \times 10^{-6}$  through  $1 \times 10^{-4}$ . Language should be added to this section and to the summary which states that the MDNR acceptable risk level differs from that of the U.S. EPA and that the estimated risk of excess cancer exceeds the MDNR established risk level in all pathways considered in the risk assessment.

**Response:** Language pertaining to the State of Michigan's acceptable risk level has been added to the text.

Comment - Ecological Risk Assessment: I would recommend that the MDNR Surface Water Quality Division review the ecological risk assessment since it consists in large part of an evaluation of the impacts to the Kalamazoo River ecosystem.

Response: The ecological risk assessment previously has been reviewed by the MDNR.

Comment - Section 2.3.6: The statement that the observed fauna behaved normally and did not demonstrate any inhibited or weakened behavior is trivial. Assessment of deleterious effects on wildlife cannot be made based on the observations of site visitors. The effects of environmental contamination on wildlife ecosystems are often extremely subtle and remain undetected in the absence of intense study.

**Response:** The statement that the observed fauna behaved normally and did not demonstrate any inhibited or weakened behavior has been deleted from the ecological risk assessment text.

Sincerely yours,

WW ENGINEERING & SCIENCE

**Environmental Services** 

Elizabeth Bartz

Site Project Manager

cc: Pat Vogtman, U.S. EPA Project Officer

04011, 32